NOTES.

Much has been said lately about the commercial possibilities of aircraft after the war, and the question of an aerial post has been discussed by a responsible committee; yet to the man in the street such a proposition seemed to be rather far-fetched. The splendid flight made on September 24 by Capt. Giulio Laureati from Turin to London was a most practical and striking demonstration of the possibilities of the use of aircraft, and could scarcely have come at a more appropriate time. Capt. Laureati flew the whole distance of 650 miles without descending in seven hours and twenty minutes, a speed of eighty-nine miles per hour. The wind was adverse, so that the actual flight speed was above this figure. Letters were carried, including one from the King of Italy to our own King; and the Italian morning papers were delivered in London in the afternoon. A more direct proof of the practicability of the rapid delivery of light articles over long distances by means of aircraft could scarcely be imagined. The machine flown was one built by the Società Italiana Aeroplani, fitted with a Fiat engine, a similar machine to that on which the same pilot previously flew 920 miles without stopping—from Turin to Naples and back. The present flight is the longest "international" flight yet made, and the pilot met with a very warm reception at Hounslow, where he landed, and where he was met by representatives of the Air Board, the Admiralty, and the War Office. Capt. Laureati deserves the highest congratulations on his splendid feat, and it is to be hoped that this flight marks the commencement of a new epoch of rapid transit from country to country by means of aircraft, with a corresponding benefit to international trade.

The August issue of the Proceedings of the U.S. National Academy of Sciences contains reports of the meetings of the Executive Committee of the National Research Council since April 4 last. At the meeting on June 21 it was announced that the Carnegie Corporation of New York had authorised a grant of 10,000*l.* to the Carnegie Institution of Washington for purposes of the National Research Council, with the understanding that disbursements on account of this donation should be made at the discretion of the president of the institution. The committee appointed to consider the question of the organisation of State research committees and their relation to the National Research Council recommended that a letter offering the complete co-operation and assistance of the National Research Council be sent to those State councils which have already organised research committees, and that a letter be sent to the proper officer of all the State councils of defence which have not already organised research committees pointing out that the National Research Council has carefully considered the question of the general organisation of State committees or councils of research, and has come to the conclusion that such organisation should be determined by local needs and conditions. Local causes, such as the development or investigation of natural resources or the proper development of the use of research methods in industries, or the correlation of industries with research laboratories already existing at educational institutions, may make it very desirable to organise such State research committees. In fact, the present emergency offers, in some respects, an unusual opportunity for improving the correlation of industry and research, and it is highly desirable that those concerned with this development should not only consider it with reference to the emergency, but should also plan for the permanent continuance of any research committees which may be formed.

A report presented at the Newcastle meeting of the British Association last year directed attention to the lack of organisation and general neglect of higher geodesy in the United Kingdom. The discussion upon this report led to the extension of the terms of reference of the committee so as to include, in addition to geodesy, other departments of geophysics, such as terrestrial magnetism, tides, atmospheric electricity, and seismology. It was felt that steps should be taken to constitute a committee or association to promote the advance of the various branches of science which deal with the physical, metrical, and dynamical properties of the earth, on both their theoretical and observational sides. We are glad to learn that such a committee has been appointed by the British Association and has arranged meetings for the discussion of geophysical subjects. The first meeting will be held in the apartments of the Royal Astronomical Society on Wednesday, November 7, at 5 p.m., and will be presided over by the chairman of the committee, Sir Frank W. Dyson, the Astronomer Royal, who will make a brief statement concerning the objects and future programme of the meetings. The subject of magnetic surveys will be introduced by Dr. S. Chapman, who will make a report on magnetic surveys and charts by land and sea throughout the world. Dr. G. W. Walker will give an account of the recent magnetic survey of the United Kingdom made under the auspices of the Royal Society and the British Association. Major Lyons will exhibit and describe two of Gauss's heliotropes, on loan to the Science Museum. At the second meeting, which has been provisionally appointed to take place on December 5, Prof. A. Schuster will preside, and Sir Napier Shaw will open a discussion on the general constitution and condition of the atmosphere, which will be continued by Mr. J. H. Jeans and others. Among the subjects which the committee has under consideration for report and discussion at later meetings may be mentioned seiches and tides; atmospheric electricity; British earthquakes; observatories; methods and instruments in connection with the various branches of geophysics; geodetic and gravity surveys; and the constitution, temperature, and other physical conditions, motions, and secular changes of the interior of the earth. Papers on these and other geophysical subjects for reading and discussion at the meetings, as approved by the committee, should be addressed to Dr. S. Chapman, secretary of the committee, Royal Observatory, Greenwich, S.E.10.

The post of Director of Food Economy at the Ministry of Food has been undertaken by Sir Arthur Yapp, the national secretary of the Y.M.C.A.

The seventh Norman Kerr lecture of the Society for the Study of Inebriety will be delivered by Major W. McAdam Eccles, on Tuesday, October 9, at 5.30 p.m., in the Robert Barnes Hall, 1 Wimpole Street, Cavendish Square, London, W.1. The subject will be "War and Alcohol."

Dr. G. T. Walker, Director-General of Observatories, India, informs us that in view of the uncertainty of postal arrangements, and in order to save space on shipping, it has been decided to discontinue sending the publications of his department out of India during the continuation of the war.

The death is announced, at fifty-six years of age, of Mr. R. D. Pullar, president of the Society of Dyers and Colourists in 1914, and chairman of the well-known firm of Messrs. J. Pullar and Sons, dyers and cleaners, of Perth. Mr. Pullar was a life fellow of the Chemical Society of London.

The Geological Physics Society has arranged a museum demonstration on "Pseudo-Fossils, or Lusus Naturæ," at the British (Natural History) Museum, South Kensington, in the Geological and Mineral Galleries, on Saturday, September 29, at 3 p.m. The demonstration will be conducted by the acting honorary secretary of the society, Mr. W. F. Gwinnell.

WE regret to record the death of Mr. F. O. Erichsen, which is reported by cable from Buenos Aires. A brief account of his career appears in *Engineering* for September 21. He was educated at Rugby School, and after pupilage with Messrs. James Simpson and Co., of London, became chief of their outdoor erection department, in which capacity he was responsible for the erection and duty trials of many large pumping plants, both at home and abroad. Mr. Erichsen was appointed a director of his firm in 1914, and was an associate member of the Institution of Civil Engineers, and a member of the Institution of Mechanical Engineers.

WE regret to note that *Engineering* for September 21 records the death of Mr. B. W. Head, on September 12, in Orange River Colony, at the early age of forty-two. After serving an apprenticeship to engineering, Mr. Head went to Cambridge, where he took a double first-class in the Mechanical Science Tripos. The work of his firm, Messrs Jeremiah Head and Son, was chiefly connected with steel-works plant, and Mr. Head took an active part in developing this work, both in this country and in America. He was a member of the Institution of Civil Engineers and of the Iron and Steel Institute.

DR. ADDISON, Minister of Reconstruction, delivered an address on September 22, in the Town Hall, Huddersfield, on "Social Reconstruction after the War." He insisted that in the past this country has not made enough use of brains. How highly trained, scientific men have overcome the difficulties of supplying our armies can never be sufficiently described, and yet before the war those men had been paid salaries, in some cases by people who ought to have known better, that were a disgrace to the community. One lesson of the war has been that it pays to employ brains and to pay for them properly. Later Dr. Addison emphasised the need for a closer association between the laboratory and the factory. Science must be brought more into industry. One of the chief reasons why the Germans invaded our markets is that they organised their buying and selling on comprehensive lines. We must do the same. The steps being taken will remove some of the difficulties in respect of our commercial intelligence. As a whole, we get what we pay for. When men in this work are paid about the wages of clerks we get value for what we pay, but we do not get what we want. Dr. Addison went on to explain that he had had prepared a precise and scientific examination of great groups of factories in this country which shows how efficient plant, method, and management yield striking results as compared with places where those conditions do not prevail. In one case, although wages had increased 20 per cent., the cost of production had fallen by 29 per cent.

DR. A. W. BISHOP, who died at Nottingham on September 9, was born at Highgate on November 25, 1867. He received his early education at Highgate Grammar School, and later, at the Royal School of Mines, showed a distinct ability in chemistry. From 1887 to 1890 Dr. Bishop worked in the laboratory of the late Prof. A. von Baeyer in Munich, and obtained the degree of Ph.D. "magna cum laude." At Munich he worked chiefly under the direction of Claisen, with whom he investigated the preparation and reactions of *d*-oxymethylenecamphor, and his thesis, "Ueber den Formylcamfer," was the result of work carried out with extreme care and ability. In 1890 he became assistant to Prof. W. H. Perkin at the Heriot-Watt College, Edinburgh; and in February, 1894, he took up the appointment of professor of chemistry in H.H. the Maharaja's College, Trivandrum, Travancore, S. India. He later became principal of the college, and in 1911 was appointed Director of Public Instruction, from which post he retired in 1915 on account of ill-health, having completed rather more than the ordinary full-time service. On returning to England, he worked under Prof. W. J. Pope in the Cambridge University Chemical Laboratory, and later joined the research department of Sir Jesse Boot at Nottingham. It was always a great disappointment to Dr. Bishop that his position in Travancore did not give him any facilities for continuing research work, and he looked forward to taking up chemical investigation again after his retirement. For the greater part of his time in India his work largely consisted in directing first collegiate education, and later the whole of the Education Department in Travancore was under his control. He also did a considerable amount of work for the University of Madras, of which he was a fellow, a member of the Senate, and a member of the Board of Studies in Physics and Chemistry. During the short time that remained to him after leaving India, Dr. Bishop was engaged in the research which he so greatly loved, and less than a week before his death, in a letter to the present writer, he expressed unabated enthusiasm for his work. His connection with India brought him many friends, and whilst they regret his sudden death, they will always remember him with sincere affection and esteem.

IN *Folk-Lore* (vol. xxviii., No. 2) Sir James Frazer tells how, on Christmas Day, 1916, a solemn act of anathema was pronounced against the Greek statesman, M. Venizelos. In this case the victim was represented by a bull's head, at which stones were thrown and curses uttered. Sir James Frazer produces many instances in which stones are flung as a form of cursing, as in the well-known case of Shimei and King David. The bull's head finds a parallel in the ritual of ancient Egypt, where, according to Herodotus, black oxen were sacrificed, and then the head of the victim was laden with curses. After this rite it was sold to Greeks, if any happened to be present; if not, it was flung into the river.

IN the September issue of *Man* Mr. A. C. Breton, describing the Tsimhian Crest Poles at Hazelton and Kishpiox, British Columbia, remarks that these interesting totemistic objects are now decaying, and are not likely to be replaced. The principal post at Kishpiox had the form of a flagstaff, 80 ft. high, painted with a long black stripe proceeding from a black head with white eyes, at the base of the staff, and this represented a snake. On a small enclosed platform in front of this were two carved wooden figures—one the "Grizzly Bear under the sea," the other a finback whale. A good specimen of a similar pole is preserved at the Pitt Rivers Museum, Oxford. Now that attention has been directed to the few remaining examples it may be hoped that the Government of British Columbia will arrange for the removal of these interesting objects to some place of safety.

PROF. ELLIOT SMITH has reprinted from vol. vii. of the Proceedings of the British Academy his lecture on "Primitive Man." He gives an interesting review of the problem as it stands at present, and makes some suggestions which deserve attention. Thus he lays emphasis on the proposition that "man's mental and moral attitude is, in a large measure, determined by those primitive instincts and customs which he shares with his simian ancestors, but also by the influence, conscious and unconscious, of the atmosphere of traditions amidst which he has grown up. At no stage of his career has he acquired highly complex and specialised instincts which impelled him, without any prompting from other peoples, to build megalithic monuments or to invent the story of the deluge independently of other people who do the same arbitrary things, as modern speculations would have us believe." Again, Prof. Elliot Smith urges that "these facts seem to emphasise how confusing is this use of the word 'age.' They also reveal how devoid of foundation is the misnamed 'evolutionary' theory that claims all these phases of culture as so many natural stages through which every people has passed in virtue of the operation of the blind forces of an arbitrary and inevitable process of evolution."

THE altitudinal distribution of birds in Europe represents an almost unworked field. Hence we welcome a most interesting and suggestive paper by Mr. C. J. Alexander in *British Birds* for August. Mr. Alexander confines himself to "Notes on Zonal Distribution in the Mountains of Latium, Italy." He divides this area into five zones, ranging from the Mediterranean, which extends from the sea-level up to between 300 and 500 m., to the Alpine, represented by exposed mountain peaks from 2000 to 2150 m. The only bird which runs the whole gamut is the black redstart. The wren, Alpine pipit, chough, wheatear, and linnet are, save the black redstart, the only residents of the sub-Alpine zone. The montane zone he finds the best characterised ornithologically of the three woodland zones. The dipper and the grey wagtail scarcely range out of the sub-montane zone. As might be expected, there is a vertical migration of the several inhabitants of these zones in accordance with the seasons, as well as a horizontal migration during the spring and autumn of birds passing to and from their breeding quarters further westward.

MOLES in captivity are notoriously difficult to manage. But Miss Frances Pitt has been remarkably successful in this undertaking, which she describes in the *Scottish Naturalist* for September. The extraordinary voracity of this animal is well known, but yet it is probably not generally realised that it will eat more than its own weight of earthworms in twenty-four hours. One of Miss Pitt's captives, weighing no more than 4 oz., ate during one month 7½ lb. of worms. Finding it difficult to maintain a supply for her captives, she experimented with raw beef, mutton, fowls' heads, and the livers of rabbits, with varying success. Cheese always seemed to be acceptable. Placed in glass boxes, she was able to watch them at nest building and excavating. When burrowing, the earth dug by the hands was thrown out by the hind feet, which were also used in cleaning the fur and the hands. But this paper, which has not yet reached its completion, is too full of interesting matter to be briefly summarised; it must be read at length by all who are engaged in the study of animal behaviour.

IN his account of the Echinoderms other than Holothurians obtained by the British Antarctic (*Terra Nova*) Expedition, 1910, and recently published by the British Museum, Mr. Jeffrey Bell lays great stress on the extraordinary variety in the characters of most of the Echinoderms collected in the Antarctic regions, although the conditions of depth and temperature are practically uniform. So astounding are the variations of the starfish, *Cycethra verrucosa,* that "if a mystic wanted a type of human life he might well take this species." A whole plate is devoted to these variations, and another to the variations of the brittle-star, Ophiosteira. The most interesting forms described are perhaps the three new species of Astroporpa, Astroschema, and Astrotoma, and it is rather strange that neither these nor the new starfish, *Luidia scotti,* should have been accorded any illustration. The course followed by Mr. Bell runs counter to that now strongly advocated by many systematists, but there is something to be said for it all the same. We note that Mr. Bell refers to his three new brittle-stars as "Astrophiurids." His original term was "Astrophiuræ, or Cladophiuræ." His present term implies that they belong to the same family as Astrophiura, which, as he well knows, is a totally different thing.

IN *Naturen* for May and June Hr. Jan Petersen describes and illustrates a number of newly discovered figures of animals incised by Stone-age artists on rock-surfaces in southern Norway.

THE vexed question of the age of the Borrowdale volcanic rocks, which add so much to the picturesque scenery of Cumberland, rises again in a paper by Mr. J. F. N. Green on "The Age of the Chief Intrusions of the Lake District" (Proc. Geol. Assoc., vol. xxviii., p. 1, 1917). The Borrowdale lavas are placed in the Llanvirn series. The Carrick Fell complex is shown, on the evidence of pebbles in the Watch Hill beds, to be older than the Bala rocks, and, with the Eskdale granite, it is regarded as belonging to a late phase of the Borrowdale activity.

IN a short paper on "The Geology of the Fiji Islands" (Proc. Nat. Acad. Sci., vol. iii., p. 305, 1917), Mr. W. G. Foye, of Middlebury College, Vermont, indicates that the present coral-reefs of the Fijis depend for their form on Pleistocene and recent movements, and that the growth of atolls and barrier reefs in this region is due to local and not to widespread subsidence. The submergence is more recent than the return of the waters to the ocean after the Glacial epoch. The author's paper on the same subject in the *American Journal of Science* has already been noticed (NATURE, vol. xcix., p. 471).

PROF. J. W. GREGORY's lecture on "The Flowing Wells of Western Queensland," delivered in Australia in 1914, has been printed in the Queensland *Geographical Journal,* vol. xxx., p. 1 (1916). The vital question of the duration of these wells and the progressive diminution in their output is seen to be unanswerable at present. The discussion on the resolutions which followed the lecture shows that the diminution in supply may be due to escape in the bore-holes and choking of the inlets, and that there is a tendency to regard with favour Prof. Gregory's view as to the plutonic nature of the water-bodies.

IN the issue of *Scientia* for August, Mr. W. B. Wright, of the Geological Survey of Ireland, furnishes a useful review of "The Interglacial Problem," in which, following and extending the views of Penck, he shows that interglacial deposits indicate a woodland phase, followed by a steppe phase. He urges that the latter points to the oncoming of a glacial epoch, but extends well back into interglacial time. The single interglacial episode recorded in many northern areas, such as North America, may be explained by the fact that the longer of the Alpine interglacial epochs alone had any marked effect on the larger and more stable ice-sheets.

A REPORT published by the Royal Cornwall Polytechnic Society gives meteorological tables for Falmouth Observatory for the year 1916 and lustrum tables for sea temperatures, 1911–15. Mean sea temperatures are also given for the period of thirty-six years for each month. The lowest mean is 47·1° F., in February, and the highest 59·7° F., in August, the mean for the several seasons ranging 12·6° F. during the year. Detailed values for the several elements are given in the meteorological tables, and comparisons are made with the averages for a long period of years. The new units of millibars for the barometer, millimetres for rainfall, and metres per second for wind velocity are systematically used, but temperature values are given in Fahrenheit. Falmouth Observatory is one of the Meteorological Office weather stations, and the records are of a high standard.

Symons's Meteorological Magazine for September deals tentatively with the rainfall of August and the summer of 1917. It promises later to utilise more fully the ample details supplied by numerous observers. The south and south-east of England, which felt the full influence of a partial drought in the middle of last June, have since experienced rainstorms of considerable magnitude. In August large portions of the country had more than 6 in. of rain, the fall exceeding 10 in. over the elevated parts of Devon and Somerset. In the normally rainy portions of England and Wales the rains exceeded 20 in. during the month, and in parts of Ireland the measurements exceeded 10 in., in many places constituting an extreme record for the month over a long series of years. In Scotland the rainfall was generally less remarkable, but the mean atmospheric pressure for the month was the lowest recorded in August for at least fifty years. For England and Wales the August rainfall was 192 per cent. of the average, for Scotland 121 per cent., and for Ireland 192 per cent. During the wet August of 1912 the rainfall in England and Wales was 198 per cent. of the average, but in Scotland it was only 119 per cent., and in Ireland 129 per cent. For the three summer months, June to August, the rainfall was more than 40 per cent. above the average over the greater part of the south of Ireland, south-west Wales, and south-east of England. Portions of Middlesex, Surrey, Sussex, and Kent had an excess of more than 80 per cent. of rain, rising in patches to double the average. Less than the average rain fell in the north and west of Scotland, and as far south as Morecambe Bay. In the northern midlands of England the rainfall was only slightly above the average.

SCIENTIFIC PAPER 300 of the Bureau of Standards contains a summary of the results obtained by Mr. W. W. Coblentz in his researches on the emissivity of the tungsten filaments of incandescent electric lamps filled with nitrogen. Both straight and coiled filaments have been investigated, the latter being the more efficient owing to the diminution of the heat convection and conduction losses for them. The coils had an inside diameter and a pitch twice the diameter of the filament. The radiation from an element of surface within the coil was found to be 90 per cent. greater and relatively redder than that from an outside element. The difference between the two was found to be in agreement with that calculated on the assumption of multiple reflections within the coil. Neither the internal nor external radiation E can be expressed in terms of the wave-length λ, and the absolute temperature T by any formula of the Wien type, *i.e.* $E \propto \lambda^{-c_1} e^{-c_2/\lambda T}$, in which c_1 and c_2 are constants.

La Nature for September 1 contains an article on recent improvements in wireless telegraphy by M. H. Volta. Fifty lines of it have been censored by the French authorities, but enough of the article remains to show how well the importance of the subject is appreciated in France. After describing the principles on which the earlier detectors—the iron or nickel filings coherer, the electrolytic, the thermoelectric, and the magnetic detector operated—the author shows how these have been superseded by the electronic or "valve" detector, and describes several of the forms and circuits at present used. By coupling a number of these detectors in series a high degree of sensitiveness may be secured, but Pratt, of the University of California, has introduced a combined electronic and thermoelectric detector, by means of which he has detected signals from stations 10,000 kilometres away. The General Electric Co. of Schenectady has shown how electronic "valves" may be used as sources of wireless waves, and it is not too much to say that the "valve" has revolutionised wireless telegraphy. The problem of diminishing the disturbances which so seriously interfere with the use of these sensitive pieces of apparatus has to some extent been solved by dividing the antenna into sections separated by inductances and connected to earth by inductances which give the parasitic currents a frequency differing from that of the signalling current.

THE greater part of the roof of the Library of Congress, Washington, U.S.A., is covered with tinned sheet copper, all of which is from the same manufacturer, and was installed at the time of the completion of the building in 1893–94. This has undergone a curious corrosion process which presents some unusual features, and has been investigated by P. Merica and reported on in Technologic Paper No. 90 of the Bureau of Standards. The roof is situated in a district uncommonly free from smoke, and it is not near any power station or factory producing smoke, so that atmospheric conditions may be regarded as most unfavourable for corrosion. Nevertheless, the sheet has become badly pitted on the upper side, and the pits occur in general along the line of surface scratches. They are apparently unrelated to the service conditions and to the direction of the rolling of the sheet. When the copper became exposed, as in the present case, at the bottom of the scratches on the surface, it formed a galvanic couple with the alloy layer, electrolytic action set in, and the copper at these points was corroded, forming the pits described. This publication gives the results of a study of the structure of the tin coatings on copper, and it is shown that this coating consists of at least three layers, viz. a thin layer of Cu_3Sn immediately next the copper, then a layer of the constituent "H," containing about 60 per cent. by weight of tin, and finally a layer of the eutectic of tin with copper. These alloy layers are electronegative, both to the tin and the copper base.

THE seventh and concluding article of a series on the evolution of the chain-track tractor appears in the *Engineer* for September 21. In these articles, which are fully illustrated, will be found a connected narrative showing the steps by which workable machines were produced. No mention is made of any work done in Germany or Austria, since, so far as our contemporary is aware, these countries have played no part whatever in the actual evolution of vehicles of this type. Nor has France added materially to the development of the chain-track mechanism. The system appears to have been evolved gradually by a great many workers, who have carried on their investigations independently, though for the most part on similar lines. An exception is Mr. Diplock, who alone pointed to the necessity for having the roller chain flexible, and each foot of the chain track absolutely free to move in any direction and within certain limits with respect to the other feet immediately adjacent to it, if the best results as regards friction and freedom from wear-and-tear are to be looked for.

THE latest catalogue of second-hand books (No. 169) of Messrs. W. Heffer and Sons, Ltd., Cambridge, is mainly devoted to school books, but there are sections relating to works in botany, chemistry, geology, biology, mathematics, medicine, and education, which should make it useful to readers of NATURE. Copies of the catalogue are obtainable from the publishers upon written application.